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Subject: ORD Weekly Update September 14

Administrator,

We had a productive meeting with the Environmental Research Institute of the States (ERIS) Board on September 12 at the ECOS Fall Meeting in Jackson Hole, Wyoming. We discussed priority action items from the ERIS Board-EPA joint meeting in July in Oklahoma which will guide our work plan for the coming year, the new collaborative pilots with ECOS and the Association of State and Territorial Health Officials (ASTHO) on communicating the risks of PFAS and harmful algal blooms, and improving the understanding and level of engagement of a broader group of states in our partnership work. At the ECOS plenary session we shared state-by-state summaries of how ORD's work during the past five years, in partnership with state agencies, counties, communities and universities, has supported states in their efforts to protect human health and the environment.

Hot issues

ORD supports Hurricane Harvey and Irma responses

In addition to our roles on the Policy Coordination Council and the National Incident Coordination Team, ORD is staffing the Emergency Operation Centers – 3 ORD staff are now deployed to the HQ EOC now, and 1 has been deployed to the Region 4 EOC. ORD is also providing its technical expertise via our RACER Reachback Capability: to date, ORD has coordinated and responded to requests (1) from Region 6 EOC to Identify ORD lab capacity to run fecal coliform samples; (2) from the Environmental Unit to identify toxicity values for 15 chemicals released into the environment as a result of the Hurricane/flooding; (3) from an On-Scene Coordinator to deploy a method developed by ORD that uses webcams and QR codes to assist with accountability of the many EPA personnel in the field; and (4) from the HQ EOC to compile readily available and rapid analytical methods and capabilities for characterizing flood water for microbials, chemicals, and metals - the HQ EOC later used this product to build one of many Fact Sheets about EPA's capabilities. ORD is currently identifying additional volunteers to assist in the HQ EOC.

ORD contributes to U.S. National Biodefense Strategy

As a key partner in the National Biodefense Enterprise, EPA is working with the National Security Council and the Homeland Security Community (federal and non-government stakeholders) to develop the first ever "National Biodefense Strategy" consistent with the requirements of the National Defense Authorization Act of 2017. EPA's Office of Homeland Security and ORD's National Homeland Security Research Center have been working across the Agency to assess policies, operational practices, and scientific data needs for incorporation into the National Biodefense Strategy. This strategy will serve to prioritize and coordinate biodefense initiatives to counter biothreats, reduce biorisks, and prepare for, respond to, and recover from bio-incidents resulting from pandemics, laboratory accidents, and bioterrorism. EPA's primary responsibility for a biological incident response (characterization, decontamination, and waste management), drinking water / waste water

infrastructure protection, and the underlying scientific and technical support have been prioritized in the strategy. The National Biodefense Strategy Interagency Working Group will deliver the strategy to Congress by end of fiscal year 2017.

Lead

- **Update on Galesburg, IL, lead service line replacement efforts:** On September 11, Region 5 convened a call with ORD, Illinois EPA, the City of Galesburg, and the city's corrosion expert to discuss Galesburg's activities regarding lead in drinking water, specifically, corrosion control treatment, lead service line replacement, and public education. Participants discussed the possibility of having an open forum-type public meeting in Galesburg, if scheduled, ORD may participate to discuss the lead service line replacement project being conducted in Galesburg.
- **OECA requests technical support for lead contamination in Portland, OR.** OECA has contacted ORD for technical support for lead in drinking water in Portland. Region 10 has given the City of Portland 5 years to develop a corrosion control plan so that they can comply with the Lead and Copper Rule. OECA has requested that ORD review the corrosion control plan.
- **Technical assistance on Cleveland, OH lead issues.** A consulting engineer has been working with the City of Cleveland to develop a plan to determine the type of scale that is present in existing service lines throughout their drinking water system. The consultant contacted ORD with questions regarding pipe scale analysis. On September 12 ORD offered technical support to the City of Cleveland if needed.

Smoke Sense Study Web Traffic

Smoke is impacting many communities around the country, and the Smokesense app provides timely and local air quality information to users and information on subclinical effects of smoke. EPA launched the Android version of the Smoke Sense mobile application on August 1. During August, hits on the [Smoke Sense study web page](#) increased from 40 to 5,765, with 4,747 of those visits from 'unique' individuals, rather than repeat users. The Smoke Sense hits helped drive total traffic on the Air Research page from 12,727 in July to 20,588 in August. Beta testers have been identified for the Apple iOS version of the app, which should be available soon.

Upcoming public events (look out 2 weeks)

Clean Air Scientific Advisory Committee meeting

On September 18 – 19th, the CASAC will convene a meeting to discuss the draft Risk and Exposure Assessment and draft Policy Assessment for the primary SO₂ NAAQS review. ORD scientists will participate in this meeting in person to provide scientific background on the health effects of SO₂ exposure.

Association of State and Territorial Health Officials (ASTHO) Policy Summit

ORD will participate in the ASTHO Policy Summit, September 19 in Washington, DC. ORD will co-present with CDC/NCEH/ATSDR for the *Leader to Leader Executive Roundtable Session on Safe Drinking Water and other Environmental Health Issues*, and will present on EPA and ORD priorities and our state partnership work at the Environmental Policy Committee meeting in the afternoon. The Policy Summit will be followed by ASTHO's 75th Annual Meeting September 20-21, themed *Celebrating the Power of State and Territorial Public Health*. Bringing together state and territorial health officials, ASTHO alumni and affiliated organizations, federal partners, academia, and private sector health industry executives, this meeting will highlight the decades of progress in governmental public health and ideas for addressing future public health challenges, including sessions about the opioid epidemic, early brain development, telehealth and creating a culture of health.

Science Technology Policy Council

On September 20, the EPA Science Technology Policy Council will meet. Topics include: Public Access Forum implementation status, Laboratory Enterprise Forum briefing and status of the four workgroups, Update on IRIS modernization progress, and OCSPP's TSCA Implementation Update.

International Tire Crumbs Research Meeting

On September 20th, ORD and its partners from Centers for Disease Control and Prevention and NIH/National Toxicology Program will participate in a meeting with representatives from the European Chemicals Agency and the Dutch National Institute for Public Health and the Environment. They will share information about rubber crumb in the infill material that is used in sports fields, and updates on U.S. tire crumb research and the two European tire crumb studies.

Minnesota Department of Health Demonstration

On September 27, ORD will provide a demonstration of the Computational Toxicology Chemistry Dashboard to the Minnesota Department of Health (MN DOH). ORD met with MN DOH in August so that they could outline their needs for using EPA data and tools to inform their chemical risk assessments and this demonstration is a follow-up to that meeting. MN DOH is interested in using ORD's new approaches for evaluating chemicals in their chemical risk assessment process.

State Environmental Officials to Visit ORD

Senior environmental officials from Louisiana and Florida will meet with EPA scientists and senior managers at ORD's Gulf Ecology Division on September 28. The meeting will include a tour of the facility and discussions on applied research that can benefit states. Presentations by scientific staff will describe research efforts to model the relationship of anthropogenic nitrogen to Gulf hypoxia, to develop nutrient criteria for Gulf States, to assess coastal condition across the United States, and to forecast effects of future land use decision scenarios on water quality and quantity.

Last week Highlights

Superfund

- **LCP Chemicals Superfund site:** On September 11, Region 4 and ORD coordinated a review for a feasibility study for the LCP Chemicals Superfund site in Brunswick, GA. The study focuses on a former mercury cell building crumbling under its own weight. The site borders the Turtle River saltwater marshes and Brunswick's urban communities.
- **Technical assistance to Region 4, Paducah, KY:** On September 19, at the request of Region 4, ORD will attend a meeting and tour at the Paducah Gaseous Diffusion Plant Superfund Site to provide technical support to the EPA Remedial Project Manager. Other meeting participants include the Department of Energy (DOE) and their contractors, and the Kentucky Department of Environmental Protection. The purpose of the meeting is to begin scoping the remedial investigation under the footprint of a building that is being demolished. The Paducah Superfund site is the location of a former DOE uranium enrichment plant with hazardous and radioactive wastes.
- **Technical assistance to Region 1 at Fort Devens Superfund Site:** On September 21, at the request of Region 1, ORD will meet with Region 1, the Army and its contractors, and the Massachusetts Department of Environmental Protection to discuss preliminary results of the calibration of a groundwater flow model. The model was developed by the Army to evaluate the performance of the groundwater extraction system used to capture and treat contaminated groundwater at the Fort Devens site. ORD is investigating the impact of recently-implemented remedial measures on groundwater flow and contaminant transport. Fort Devens is a former military training base with petroleum, arsenic, heavy metals, and other hazardous chemical contamination in the groundwater, soil, and sediment.
- **Omaha Lead Superfund Site:** ORD scientists provided ongoing technical support for the recently finalized report evaluating the impact of removal and remediation activities at the Omaha Lead Superfund Site on blood Pb levels and academic performance measures. This report will be used to inform follow-up studies. ORD scientists will continue to collaborate and provide technical support during the new phase of the project.

Scientists Assess World's Largest Lake System

ORD recently collaborated with EPA Region 5, the Great Lakes National Program Office, and the U.S. Geological Survey to assess the condition of Lake Superior. A depth-stratified randomized sampling design was developed to provide a statistically rigorous whole-lake assessment. Parameters included chemical and physical measurements, water quality, and distribution and abundance of biota. Innovative measures of food web function are being applied through stable isotope techniques and development of a dynamic food web simulation model to evaluate effects of management actions and anthropogenic stress. The Cooperative Science and Monitoring Initiative, mandated under the Great Lakes Water Quality Agreement between the United States and Canada, supports condition assessment of one of the Great Lakes each year. The Great Lakes hold 20% of the world's fresh surface water.

CMAQ 5.2 Model Release

The September 2017 issue of *EM Magazine* covered EPA's release of CMAQ 5.2, a powerful computational tool that simultaneously models multiple air pollutants to help environmental managers determine the most effective strategies for improving air qualities in their states and communities. The article details the model's new key features, evolution of the science, impacts, and future enhancements

Sampling Procedures Using Robotic Floor Cleaners for *Bacillus anthracis* Spores

Following the 2001 intentional contamination incidents involving *Bacillus anthracis* in the United States, the research need for remediation of contaminated buildings became evident. Subsequent surface sampling studies were emphasized due to the direct impact that sampling results have on decontamination decision making. This research indicates that commercially available robotic floor cleaners offer a safe, efficient, and economical option in addition to currently-used surface sampling methods.

Project Shows Microbiota Necessary for Normal Development in Fish Larvae

A research manuscript on the importance of intestinal microbiomes on chemical neurotoxicity is now available online via *Scientific Reports*, an open-source *Nature* journal. Intestinal microbes are thought to influence mood, anxiety, and even brain development, but little is known about potential effects on developmental neurotoxicity of environmental chemicals. The research characterized a unique zebrafish-based system to test whether chemical toxicity is modified by host-associated intestinal microbes and demonstrated that specimens devoid of microbiota have abnormal neurobehavioral development and are hyperactive. Why use the zebrafish model? Although zebrafish appear to be extremely different than humans, in fact, 70% of our genomes are common. Moreover, the developmental processes involved in growing all of the major organ systems are similar between humans and zebrafish, making this organism a cost-effective and excellent model to study human developmental diseases. The study found that microbial colonization must occur by 6 days of life to prevent hyperactivity in 10-day-old zebrafish larvae and that live bacteria, but not heat-killed bacteria, are required to induce normal behavioral development.

Advancing the Science of Children's Lead Exposure

Reducing or eliminating exposure to lead in infants and children is a primary objective for EPA. To support regulatory and other efforts to do so, it is important for Agency Program and Regional Offices, as well as partners throughout the public health community, to understand where infants and children can be exposed to lead in their environment. This week, the journal *Environmental Health Perspectives* presented the results of an ORD-lead study important to that effort. The study, "Children's Lead Exposure: A Multimedia Modeling Analysis to Guide Public Health Decision-Making," advances the science of lead exposure. The primary objective of the study was to develop a coupled exposure-dose modeling approach that can be used to determine what drinking water lead concentrations are needed in order to keep children's blood lead levels below specified values in real-world conditions, that is those that are likely to include additional routes of lead exposure from soil, dust, food, and air. The researchers concluded that:

"This methodology advances scientific understanding of the relationship between lead concentrations in drinking water and blood lead levels in children. It can guide national health-based benchmarks for lead and related community public health decisions."

Recent Publication: evaluating mine water discharges

On August 11, 2017, "Evaluating Relationships Between Total Dissolved Solids (TDS) and Total Suspended Solids (TSS) in a Mining-Influenced Watershed," was published in *Mine Water and the Environment*, a journal of the International Mine Water Association. Monitoring of TDS and TSS is required for the permitting of discharges according to Total Maximum Daily Load (TMDL) requirements. This publication summarizes research undertaken to clarify whether states can predict changes in TDS loads from changes in TSS loads. In 2012, a state proposed using the ratio approach, and Region 3 requested technical support from ORD to evaluate the validity of this approach. This work provides quantitative assessment based on evaluation of case study data from a mining-influenced watershed in Region 8. Findings demonstrate that while relationships can exist between measurements of TDS and TSS, these relationships are specific to each surface water body or watershed and may be too variable to be of practical use.